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Biofriendly nanocomposite containers with inhibition properties for the protection of metallic surfaces

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Abstract

 An attempt to combine two 'green' compounds in nanocomposite microcontainers in order to increase protection properties of waterborne acryl-styrene copolymer (ASC) coatings has been made. Nlauroylsarcosine (NLS) served as a corrosion inhibitor, and linseed oil (LO) as a carrier-forming component. LO is compatible with this copolymer and can impart to the coating self-healing properties. For the evaluation of the protective performance, three types of coatings were compared. In the first two, NLS was introduced in the coating formulation in the forms of free powder and micro-containers filled with LO, correspondingly. The last one was a standard ASC coating without inhibitor at all. Low-carbon steel substrates were coated by these formulations by spraying and subjected subsequently to the neutral salt spray test according to DIN ISO 9227. Results of these tests as well as the data obtained by electrochemical study suggest that such containers can be used for the improvement of adhesion of ASC-based coatings to the substrate and for the enhancement of their protective performance upon integrity damage, whereas the barrier properties of intact coatings were decreased.

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Keywords

Corrosion protection, Encapsulation, N-lauroylsarcosine, Waterborne acryl-styrene copolymer

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